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# Technology and the Evolution of the Human: From Bergson to the Philosophy of Technology

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# Essays in Philosophy

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## Technology and the Evolution of the Human: From Bergson to the Philosophy of Technology

### Abstract:

Philosophy of technology is gaining recognition as an important field of philosophical scrutiny. This essay addresses the import of philosophy of technology in two ways. First, it seeks elucidate the place of technology within ontology, epistemology, and social/political philosophy. I argue technology inhabits an essential place in these fields. The philosophy of Henri Bergson plays a central role in this section. Second, I discuss how modern technology, its further development, and its inter-cultural transfer constitute a drive toward a global “hegemony of technology”. The crux of the argument is that the technological impulse within humanity insinuates itself into nearly every aspect of human existence. The structures of the state, the economy, and culture, are each framed by this impulse. In the final analysis, it is argued that only a thorough examination of the intimate connection between humanity and technology can lay the foundation for a comprehensive philosophy of human existence.

Why philosophy of technology? Surely there must be experts more qualified to discuss technology...

At very least, one would hope that the last few decades of thought have managed to surpass the premise of this question. There is an increasing awareness that humanity has cast in its lot with highly integrated technological systems, as such systems have become absolutely necessary for the continued survival of the current level of world population (5 to 10 billion). Without enormous systems of intensive food production, transportation, and their attendant communication and trade networks, there is no doubt that such population levels would be impossible to sustain. Growing awareness of the potential danger that technological instruments possess if they are misused for political purposes, or if they break down due to wear or sabotage, has thrust technology to the forefront of discourse in the media and across the dinner table. Unfortunately, the discussion has been monopolized by the perceived need to secure ourselves from a potential technological catastrophe. The question of technology is dominated by concerns with how we can control the potential misuse of technology by putting in place more intensive technical means of surveillance, monitoring and preemptive action. This growing consciousness has in no way disclosed the true subtlety of the meaning and status of technology in our current historical milieu let alone for humanity. In this essay I will explore the import of philosophy of technology and elucidate a number of levels of approach that must be explored and integrated if we are to understand the ramifications of technology. Ultimately, the justification for philosophy of technology is beyond both pragmatic and utilitarian reasoning. Instead, I argue that any philosophy that ignores this essential element of the human condition is fundamentally flawed and intrinsically incomplete. What follows will begin by situating philosophy of technology with reference to how our existence is inextricably entwined

with technology. The argument is grounded in the philosophical works of Henri Bergson. I will then turn to concrete issues concerning technology and culture, specifically, how cultures are subverted by the introduction of technologies through both intra-cultural development and inter-cultural transfer. The most topical thinkers addressed in this part will be Don Ihde and Andrew Feenberg.<sup>1</sup> My thesis is that technologies are polyvalent both within and across cultural contexts. Despite the fact that the introduction of a new technology may be ambivalent to technological hegemony, it in no way threatens the hegemony of technology.

## The Place of Technology

The human being is not unique in employing instruments as an aid to survival. Several species of creatures modify their environment, others employ "found technologies" and others still fashion instruments out of reeds, sticks and grasses. This is clearly done with what Dewey called an "end in view". In *Creative Evolution*, Henri Bergson identifies this type of activity with the development of the intellect in general.<sup>2</sup> From Bergson's perspective, evolution first divides according to two survival strategies: that of plant life, which is distinguished by somnambulance (or torpor), and that of insect/animal life, which is distinguished by active consciousness (sensory motor system development). This second path continues its development along two great lines as well: The first is instinct, led by various species of insects, while the second is intellect, led by the human species. It must be noted that these differentiations in evolutionary movement occur through a shift of emphasis rather than by the possession of a unique trait. This means that instinct and intellect are each present in both lines, and have a common origin (the active, mobile, conscious way of life). One strategy must be chosen over the other due to the finite energy possessed by any given form of life. Specifically, the major difference between the latter two lines is one of "instrumentation" in the broadest sense of the term. Instinct employs organized instruments; that is, the equipment of survival is part and parcel of the physical constitution of the life form (e.g. the elegant functionality of the ovipositor stinger of a braconid wasp). We can identify instinctual organ-ized instrumentality with technique. In contrast, Intellect emphasizes the use and construction of unorganized instruments. In this case, the ends of the animal are achieved using materials that are external to the body. These instruments are employed by the bodily organization of the creature as an extension of the powers of that body (tool usage). Here we identify intellectual instrumentality with technology. What is entailed in this form of activity (the employment of means/end relations within the framework of a context) is a general knowledge of a great number of things- their properties, and their substitutability, dependent upon the situation and the materials at hand.<sup>3</sup> This *modus operandi* ties the creature's success to the ability to abstract, to categorize and to experiment with material objects, mental signs, symbols, and representations. Bergson's ultimate claim is that human evolution developed this ability to such a high degree that it to some degree has de-coupled evolutionary progression from organic change in the physiogomy of the species. From this perspective, evolution occurs via the development of intellectual and material culture in addition to organic changes in our physical nature.<sup>4</sup>

Concerning the intellect in its workings, Bergson argues in *Time and Free Will* and throughout his works that intellect is fundamentally bound up with space (understood as a mathematical grid of discrete, homogeneous units). From the paradoxes of Zeno to the development of Cartesian coordinates, from Newtonian absolute space to the Kantian transcendental aesthetic, space has been thought of in this way. Don Ihde links this idea of space to the development of cartography and its technologies.<sup>5</sup> For Bergson, this method of ordering the world originates in our need to organize our perception of the environment according to the necessities of action. Action, for a being that

employs unorganized instruments as a means of survival, implies relations of externality as a central mode of relating to the world- indeed, of understanding that world. What is important in the Bergsonian analysis is that both perception<sup>6</sup> and the structure of conception are derived from the way in which the human acts within and upon the environment. Here we find that an accounting of the technological impulse is necessary to any ontology of the human as a being living in the world. This same analysis suggests that technology also has epistemological ramifications related to how we know the world scientifically, as well as how we know the world in general.

### Epistemological Issues

The most obvious place to begin an investigation of the epistemological aspects of philosophy of technology concerns the relation between modern science and modern technology. Clearly, technology is intimately connected to how scientists *do* science. Without apparatus, science simply cannot be experimental science. As Bruno Latour has proposed, modern science is techno-science. The mundane (surface) interpretation of this ultimately neglects just how science and technology are interdependent. Technology is more than equipment employed as a means to verify scientific hypotheses. As Don Ihde has argued, technology thoroughly penetrates science. The fact that technology is more intimately involved in our understanding of nature through science becomes most apparent when one takes into account certain objects of scientific study. Ihde identifies a number of thinkers who argue that the objects of scientific study are not merely discovered or detected by technology; in many cases, they are technologically constituted. A number of "instrumental realists" argue that technology carves out or constitutes the entities being investigated (particularly, subatomic particles along with other "objects" of scientific study).<sup>7</sup> In other words, a technologically textured environment surrounding the entity is a necessary condition for the entity to appear for measurement or 'manipulation'. Whenever scientists attempt to study the very small or the very large, the ability to step beyond mere speculation depends upon the ability technologically to constitute the entity studied. For these reasons, it is clear that technology cannot be ignored, and must be carefully studied in order to clarify how and to what extent scientific inquiry is dependent upon technology.

Beyond these concerns with the practice of science and the content of our scientific understanding of nature, technology penetrates the very form of knowledge sought by science. The thought that science progresses deductively, by defining the constituents of the universe, mathematically representing them and finally determining the validity of theory via the construction of experiments (mental or laboratory), leads one to ask about the relationship between mathematics and science. In his *Discourse on Metaphysics*, Leibniz argues that force is what is most essential to nature.<sup>8</sup> This shift away from the prevailing thought that extension is essential to bodies and the measurement of their motion brought about a change from a geometrical model of corporeal nature to an algebraic one. This particular realization, one that replaced the principle of the conservation of motion with the principle of the conservation of force, represents an essential aspect of how modern science views the world. Martin Heidegger formulated the essence of modern science as a way of revealing the world as "a coherence of forces calculable in advance."<sup>9</sup> He argued that although modern science chronologically preceded modern technology, historically speaking, the essence of modern technology preceded modern science. The crux of his position is that the impulse to determine the truth of things via measurement and mathematical calculation (with an eye to prediction) is in reality a product of the essence of modern technology. Most succinctly, Heidegger's position is that

the idea that nature is a "coherence of forces calculable in advance" issues from an impulse to set upon nature and challenge forth the energies concealed within it so as to unlock, store, and switch them around for any purpose whatsoever. For Heidegger, setting upon nature as a standing reserve of resources is identified with the essence of modern technology (the challenging of nature to reveal hidden potential energy in order to unlock it for storage and transfer for use). Whether or not one accepts the Heideggarian position on the primacy of the essence of modern technology in relation to the essence of modern science, it seems impossible to separate science from mathematics. Even if one argues that science merely uses mathematics as a means of expression, the act of calculating forces which interact according to consistent laws allowing us to predict future states of the universe seems essential to the scientific enterprise.

I mention this because there is an intimate relationship between mathematics and structure of the intellect (and hence technology) in Bergson's philosophy. The intellect and perception are both directed toward the external world. This directedness is always tied to action, that is, it is bound up with *techné* in that action for the human demands technology (if we are to admit that it is highly unlikely that we could survive without employing technology at some level or another). Bergson's argument is that the field of action is space, which itself is a system of discrete, homogeneous units in the same way that mathematics is a system based upon discrete, homogeneous units. Furthermore, Bergson does not reduce the intellect to the act of spatializing the external world. It functions through generalization, abstraction and representation, and is tied to the formation of the structure of language. At this fundamental epistemological level, discerning the role that the technological impulse plays is an important moment in any comprehensive philosophy of knowledge. Our understanding of the world is technologically textured if not in fact technologically constituted. Without a thorough investigation of the way in which these forms of mediation could bias or at very least make possible our understanding, our knowledge of the world will remain uncritical and based upon articles of faith.

### **The Dialectic of Habit and Creation**

If one were to characterize Bergson's single most substantial philosophical contribution, it would be that he brought *time* back to the discourse of philosophy. Lurking behind modern philosophy, and indeed western philosophy since Aristotle, was a misapprehension of the nature of time. Bergson eloquently showed how the concept of time as the measure of motion was really space wearing an elaborate disguise. Time, as a homogeneous agglomeration of discrete units, is equated with space insofar as space is the same type of plenum (homogeneous, discrete and unitary). His argument is that time is a heterogeneous interpenetrating flux, and he does not merely mean psychological time. It is the intellect's representation of time (homogeneous and unitary) that leads to false problems in philosophy. In his first published work, he attempted a resolution of the problem of free will and determinism by recontextualizing the discourse within a temporal rather than a spatial paradigm. What we find throughout Bergson's thought is the dialectic of habit and creativity. This dialectic permeates human life (and life in general) at the levels of the individual, society and species. Life fixes itself by creating a habit structure that ensures survival within its environment (habitat). Individuals, societies and species create systems of nourishment, procreation and territorial occupation/organization. This organization sediments into habit and eventually distinguishes the "type" of the creature. Accordingly, change (creativity) may occur in three ways. First, the creature may spontaneously modify its habit (including its physical constitution). Second, the environmental

conditions may change so that the creature must adapt by changing its habit. Third, the interaction between the creature and the environment may mutually bring about changes in the habit and the habitat. If we accept that human evolution takes place through material and intellectual culture as well as through physical transformation, then we must carefully consider how technology is involved in culture. For my purposes here, I will later concentrate on modern forms of technology, those that involve a complex web of other technologies for their production, use and maintenance.

Keeping in mind the dialectic of habit and creation and the three ways that change may occur, we must begin with the question of the neutrality of technology. Many of those who argue that technology is not worthy of philosophical scrutiny base their position upon an ethical assessment of the status of technology. Their argument is generally reducible to the following: Technologies can be used with either good or bad intentions or have either good or bad consequences; therefore, technology must be morally neutral. For instance, nuclear technology can be used to produce electricity for millions or to destroy similar numbers of people. Point made. Then again, the same argument can be used to argue for the moral neutrality of police states and totalitarian regimes. However, the question of the non-neutrality of technology is not only an ethical question.<sup>10</sup>

Don Ihde has returned to the neutrality debate in a number of works. His argument is that technology is non-neutral but context dependent.<sup>11</sup> This non-neutrality displays itself in three ways. On the individual level, people experience both embodiment and hermeneutic relations to technology. In embodiment relations, bodily perception is extended by the use of tools, such as a blind person's cane or a dentist's probe. It is in this form of relation that the non-neutrality of technology is most evident in that the "amplification-reduction" affect stands in clear relief in such experiences.<sup>12</sup> The dentist probe transforms experience by reducing certain qualities of the tooth (its wetness and texture) while amplifying the perception of others (its hardness and porosity). In hermeneutic relations, one "reads" a representation of the quality of an object through the instrument without perceiving that quality (as when one reads the temperature from a gauge on a blast furnace without experiencing the heat). A third category of relation between the human using technology and the world occurs when technology constitutes the phenomena itself, as in the case of perceiving/measuring subatomic particles mentioned above. The first two of these relations are examples of how technology mediates experience, and through this mediation, alters the experience of the phenomena much like a translator who judiciously mistranslates the tone of the speaker's original statement or eliminates content from that statement in order to facilitate further communication. If one accepts that the third relation is true, technology not only mediates the world, but also creates parts of the world for mediation. A fourth instance of non-neutrality arises when experiments on the subatomic level alter the phenomena itself (consider wave-particle duality and the measurement of photon location altering the spin of the measured photon as well as any photon once entangled with the measured photon). In each of these examples, technology is non-neutral in terms of the experience of the world and the objects within that world.

Of course the non-neutrality of technology is a manifestation of the non-neutrality of the human being. We create technology and these creations alter our habit and the environment. Through architecture and climate control devices we create techno-environments of increasing size and complexity. Large-scale industrial complexes and industrial zones have significant impact upon the environment and some propose that certain urban areas are currently creating weather patterns in their outlying areas. This is in keeping with the first mode of change in the dialectic of habit and



creation. However, under these conditions, technology begins to appear on both sides of the dialectic. It is not only part of the habit, but also part of the habitat. Historically, this change first appeared in the philosophy of technology as a concern with technological imperatives, spawning the doctrine of technological determinism. Suddenly technological systems were seen to exert the second form of change in which the technological environment forces the habit of the creature to change on both the individual and societal levels. Thinkers such as Jacques Ellul, Herbert Marcuse and Langdon Winner argued that technology has transformed society such that the individual must conform to its imperatives.<sup>13</sup> On the individual level, Winner identified a reverse adaptation between the user and the technology. An example of this is the adoption of the "qwerty" keyboard. In this case, the keyboard layout was invented in order to slow down secretaries whose typing speeds continually jammed the typewriters. This inefficient configuration slowed the workers enough so that the machines could function. The user, however, had to adapt to the needs of the technology rather than the other way around. On the social level, Winner argued that technologies are like forms of life in that they themselves have politics.<sup>14</sup> The best example of this is nuclear power that tends toward authoritarian governmental structures with strong police powers due to the dangers of its byproducts. The rationale behind this insight is becoming all too apparent under current political conditions.

The third possibility of change in the dialectic of habit and creativity is also found in the interaction between technology and the human. Given that the human creates technology which then appears as part of the habitat once it reaches a sufficient level of complexity, still allows a certain amount of "interpretive flexibility."<sup>15</sup> Andrew Feenberg uses the example of the Minitel computer system in France which was reconfigured by users to set up an alternative means of socialization. This "misuse" of the system displays how individuals and technologies enter into a relation of reciprocal adaptation.<sup>16</sup> In this case, people redefined the parameters of the technological habitat that afforded a new habit structure a space within which to form. Moreover, the two mutually transformed one another in a feedback relation, reciprocally. Given the complexity of the relationships between society, technologies and technological systems, careful philosophical inquiry into these relations is warranted.

### **The Poly-valence of Technology in Development and Transfer**

Without doubt we have entered a regime of global modern technology. The pockets of culture which continue to subsist out of the reach of this new world praxis are rapidly dwindling. Instead of "History" fulfilling Marx's prediction of a bourgeois infiltration of all cultures leading to a worldwide proletarian revolution, we have witnessed a technological expansion which in no way could have been anticipated until it had already taken root. This is due to two facts. First, the technological invasion was piggy-backed on capitalism's movement across the globe and second, socialism is not essentially anti-technology (arguably the opposite is true).<sup>17</sup> Cultures, in attempting to adopt or resist this insurgent political and economic system and the countries which export democratic capitalism, have become unwittingly seduced by the instruments necessary for such an order to be introduced into their cultures. In itself, this fascination with other people's social products has a long history. Travelers have borne gifts and returned to their homes with both tales of their encounters with other cultures and tokens of those societies in the form of artifacts. This has been the means whereby cultures have exchanged ideas and objects, and often assimilated aspects of one another. However, these artifacts did not have the social impact that modern production and

communications technologies have had.<sup>18</sup> The cultural products transplanted in the past were generally looked upon as curiosities or were adopted into the culture as it was. Succinctly put, these technologies did not dictate the future progression of the society. The vital questions are; does technology constitute a necessary form of development within societies that are intensively dependent upon technology? Do modern technology transfers alter individuals in such a way that their cultures are transformed by the integration of these transferred technologies? Are social configurations which result from the transference determined by the technology?

The totalitarian character of technology has been an issue around which a great deal of scholarship in the philosophy of technology has focused. The question as to whether technology itself is determined by, determinate of, or ambivalent to society's structure has become a major point of contention among social theorists. Arguing about the status of our autonomous tools and productive ensembles will not resolve the problem of the relation between people and their circumstance. Population increase, resource depletion, and environmental degradation are human problems that can only be addressed by a view aiming at transforming the human agent and its relation to its activity within the world. Yet, given the intimate connection between technology and the human, as addressed above, we must carefully consider both the individual effects of using technology as well as the cultural impacts of technological transplantation.

The ways in which technology is embedded in society is thoroughly discussed in Andrew Feenberg's *Critical Theory of Technology*, where he claims that any given technology is ambivalent to the impact of its social uses until it is incorporated into the "technological code" of the culture.<sup>19</sup> In other words, technological innovation can actually threaten technological hegemony until it can be encoded. The thrust of his argument is that any sort of technological rationality as a totalitarian force determining society can not be said to be technological in nature. These remarks are directed both at Foucault's analysis of society and Marcuse's thesis of technological rationality instituting a regime of total administration. In *One-dimensional Man*, Marcuse argues that the collapsing of the universe of discourse into the totalitarian ideology of technological rationality has instituted an irrational system of rationality, and this has become the status quo in late modernity. According to Marcuse, technological rationality (one-dimensional thought), with its self-circulating action, co-opts all change so that it is either rendered consistent with the status quo, or is shown to be irrational. Therefore, there can be no alternative to the system in its never-ending production of the happy consciousness that ensures that this system delivers the goods. In this condition, all qualitative change is neutered and rendered impossible. This type of constructed reality is self-sealing in that any evidence that contradicts the ideology becomes further support for that ideology.<sup>20</sup>

Feenberg's approach recognizes the tendency of technology to produce hegemony (it institutes a habit), but maintains that this process is not technological in nature. Instead, he finds that there are three codes which struggle between and order one another, namely, the code of power, the code of capital, and the code of technology. It is capitalist technology, or rather the technological code that is within the sociogram of capitalistic codification and representative government, which tends to be dominated by this form of technological order. It is not technology *per se* that Marcuse critiques, but rather it is the specific form that technology takes under capitalism and "representative" government; the ideological form of technology that protects its sovereignty through self-sealing circularity. Feenberg argues that the weakness of Marcuse's perspective is that he lacks a critical



theory of technological hegemony.

Feenberg's claim that technology is ambivalent to the technical code and its configuration within culture is supported by the example of the introduction of integrated computer networks in the workplace. One of the effects of the greater communications across various departments of a company breached management's monopoly over the knowledge of the labor process and the state of the corporation (the cornerstone of Taylorist industrial organization). Ironically, it was the fact that the technology was operating properly that often led to secondary breakdowns within the management structure and its central control over the various strata of lower management. The loss of control over information threatened the organization of power within the corporation. Feenberg thus argues that the introduction of a technology can either promote technological hegemony or destabilize the hegemony habituated within the system (it is ambivalent).

As I understand it, Feenberg argues that the technical code (or one or more of the others) imbues the technology with value and the technology itself is ambivalent until it is assimilated. In my view, value is inherent in the technology from the start. It is produced to perform specific tasks, and these tasks, as well as the production itself, are already within a *projected* value matrix (a place in the technological order).<sup>21</sup> The deployment of the technology may end up having unforeseen uses due to the "interpretive flexibility" pointed out above, and these may alter the form of hegemony by refiguring the code(s), but that transformation is not necessarily due to a relation of mere ambivalence. I propose that technology is in fact poly-valent, by which I mean that there are a number of ways a technology may figure into the prevailing technological habitat, but there are a limited number of ways that it is able to do so. Much as an element that can have more than one possible valence when bonding with other elements but cannot have just *any* valence (it is afforded a determinate set of possibilities), technologies can figure into the code in a limited number of ways. I believe that Feenberg would agree with my analysis here given his later defense of Marcuse. My point is that a technology can overcome other technologies (even a hegemonic code of technology), but no technology can overcome Technology as a whole, that is, as a hegemonic movement within modern history.

On its face, this claim may seem unsupportable, bordering on positing a metaphysical entity named Technology. This is not my intention. Taking into account where this essay begins, situating technology within the evolution of animal species, and as most developed in the human species, modern technology can only be understood with its necessary complement: the human. Justifiably, our hyper-technological development thoroughly permeates every aspect of modern life. Each code identified by Feenberg may be understood as essentially technological in nature. The code of power has effectively developed into the "State Mechanism." Political power has been reinterpreted as a machine that produces legitimacy for ordering a political culture within a society and managing inter-cultural exchange (trade, war, discourse, etc.). More and more, this mechanism is congealing into one form: the "representation machine." The aggressive demand for democracy across the globe, fomented by American politics and even the United Nations, for that matter, is a sign of a developing hegemony of this form of organization (the supremacy of this machine and its form of legitimacy). The code of capital has transformed trade into "The Economy." Economy under the code of capital is best understood as a surplus value machine that produces growth. Growth is understood as the production of surplus value and the assimilation of surplus value as profit and profitability. The "Surplus Value Mechanism" gains its legitimacy from two sources. First, it is its

own legitimacy insofar as it delivers the appearance of delivering survival and a surplus of what is needed for survival of the population. Second, the State Mechanism legitimates the Surplus Value Mechanism by regulating and promoting it. Likewise, the State Mechanism both legitimates itself and is legitimated by the code of capital. It is self-legitimizing because it is representative, and to be representative is to be legitimate. The State is also legitimated by the Surplus Value Mechanism because that mechanism delivers the goods that are necessary for and in excess of survival, and promotes the legitimacy of representation by allowing itself to be regulated by the State. The confluence of economic and political globalization displays how these two great mechanisms constitute a growing momentum headed toward the hegemony of technology- are becoming a totalitarian organization of the species.

The code of technology is the means by which this mutual support network fixes its progress in a habit of technical systems: the political and economic habitat. It also generates further progress by replicating its mode of organizing the environment by using development as a means of infiltrating the unassimilated parts of the globe. It further augments and reconfigures the existing habitat through technological innovation within the already established cultures under that code of technology (the polyvalent re-figuring of technological hegemony in its current form). Technological transfer across cultures involves those cultures in the power and capital structures which produce those technological systems. This endangers the receiving culture's ability to resist the globalizing trajectory of the technological impulse in its fully developed form.

The major impediment to this process concerns the way in which technologies are related to culture. As Ihde has pointed out, technology is context-dependent in that it is embedded in the culture's world-view as a set of practices with more or less definite meanings for that culture. Due to the "cultural embeddedness" of technology, it would be imprecise to claim that technology is ever transferred in a strictly ideological form. Instead, an interface between the products of one culture and another form a conduit between the world-views which characterize one cultural form of human activity as opposed to another.<sup>22</sup> The exchanged artifacts may or may not be embedded in the receiving culture the same way as in the sending culture. Rather, they are retranslated into the 'language' of that culture; they are interpreted according to the way they *fit* with all of the other technologies and cultural practices existing in the receiving culture. This leads Ihde to claim that although technology is non-neutral (it transforms "humans and humans-in-culture"), it does not have one specific trajectory. In other words, it is structurally ambiguous.<sup>23</sup> However, he also purports that they are acidic to traditional cultures.

This last point needs explanation. Technologies form a web of dependencies. For instance, telephones depend upon parts made by both the metal industry and the plastics industry. The building of communication networks depends upon the transportation system, which itself depends upon the petrol-chemical industry, etc. As a culture begins to pick and choose technologies to employ and import, it inevitably gets bound up in an extremely complex set of political and economic relations. This means that their rhythms of business and ways of pricing their markets must interact with those other systems. Inevitably, those who employ time-efficient technologies will conduct more business for less cost and will be able to push slower and more costly competition out of business. Meanwhile, the social aspects of face-to-face business transactions and the traditional ways of doing business will slowly dissolve in a society that adopts telephony.

Many humanitarian efforts have the same effect. Bringing medicines into "underdeveloped" areas that have high infant mortality rates is a worthy and humane gesture. However, the resultant increase in population can only be sustained through an increase in the technological capability of the culture. Here the State and Surplus Value Mechanisms pick up where the World Health Organization leaves off. Development schemes and economic assistance pour into regions and deploy their technological systems as a means of providing for the excess of people that are a product of the initial humanitarian effort. The indigenous culture that receives this aid is overwhelmed by the imported equipment and the modes of organization necessary to maintain that equipment. New modes of social organization arise and the march of technology continues across the globe.

## Conclusion

I began with the question of why technology requires philosophical scrutiny. Clearly, technology haunts crucial areas of philosophical study. Issues concerning the nature of man, the nature of knowledge, and political economy each involve technology in essential ways. What is suggested at the end of this work is that the State, Economy and way of understanding the world are each penetrated thoroughly by technology and technological thinking. These three form an interdependent self-reinforcing system that threatens to subvert alternative forms of understanding and social organization. If technology is rapidly becoming a totalitarian force instituting the hegemony technology, and the human is its necessary complement, then philosophy of technology becomes essential to our understanding of ourselves and our circumstances. Ultimately, this essay argues that locating the place of technology within the greater philosophic project is the first step in laying a foundation for a systematic and comprehensive philosophical inquiry into the nature of human existence.

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## Sources

Bergson, Henri *Creative Evolution* (Lanham: University Press of America, 1983).

.....*Matter and Memory* (New York: Zone Books, 1991).

Feenberg, Andrew *Critical Theory of Technology* (New York: Oxford University Press, 1991).

.....*Questioning Technology* (London: Routledge, 1999).

Heidegger, Martin *The Question Concerning Technology and Other Essays* (New York: Harper and Row, 1977).

Hyde, Michael J. ed. *Communication Philosophy in the Technological Age* (Alabama University Press, 1982).

Ihde, Don *Instrumental Realism* (Bloomington, Indianapolis: Indiana University Press, 1991).

.....*Philosophy of Technology: An Introduction* (New York: Paragon House, 1993).

.....*Postphenomenology: Essays in the Postmodern Context* (Evanston: Northwestern University Press, 1995) .

.....*Technology and the Lifeworld: From Garden to Earth* (Indianapolis: Indiana University Press, 1990).

Leibniz, Gottfried *Discourse on Metaphysics and Related Writings*, tr. R.N.D. Martin and Stuart Brown.

(Manchester and New York: Manchester University Press, 1988).

Marcuse, Herbert *One Dimensional Man* (Boston: Beacon Press, 1964).

Merleau-Ponty, Maurice *The Phenomenology of Perception* (New Jersey: The Humanities Press, 1962) .

Schiller, Herbert I. *Communication and Cultural Domination* (New York: M. E. Sharp Press, 1976) .

Watzlawick, Paul *How Real is Real: Communication, Confusion, Disinformation* (New York: Penguin Press) .

.....*The Invented Reality* ed. Paul Watzlawick, (New York: W. W. Norton & Company, 1984) .

Winner, Langdon *Autonomous Technology: Technics out of Control as a Theme in Political Thought* (Cambridge, MA: M.I.T. Press, 1977) .

.....*The Whale and the Reactor* (Chicago: University of Chicago Press, 1986).

## Notes

1. My position can be seen as both an extension and refinement of the positions of Ihde and Feenberg. With Ihde, I agree that technologies are acidic to traditional cultures, are culturally embedded and never transferred without hermeneutic differences. I also agree that they are fundamentally ambiguous, however, I am unsure as to whether Ihde would be entirely comfortable with my notion of technological determinism (what I call the “hegemony of technology”). Likewise, with Feenberg, I agree that introducing new technologies threatens technological hegemony (in his terms technology is ambivalent to technological hegemony). However, for my purposes, I believe the notion of polyvalence (borrowed from chemistry) is more appropriate to the way in which technology and culture mutually configure one another.

2. Bergson, Henri *Creative Evolution* (Lanham: University Press of America, 1983) pp133-65. The term intellect should be understood as an active mode of thought with certain characteristics. Ultimately, its action can be reduced to cutting, isolating, placing and ordering. Higher functions include generalization, abstraction, representation, and calculation.

3. Ibid. pp150-1.

4. One may here think of the philosophies of Hegel and Marx as the first clear demarcation of this dialectic between rational and material development. That much neo-marxist thought has been involved in developing the technological determinist position will also be important to the latter stages of this essay.

5. Ihde, Don *Philosophy of Technology: An Introduction* (New York: Paragon House, 1993) p57-8.

6. The claim that perception holds more than a speculative function, but is rather entirely bound up with action is a major thesis of Bergson's *Matter and Memory* (New York: Zone Books, 1991) p31.

7. Ihde, Don *Instrumental Realism* (Bloomington, Indianapolis: Indiana University Press, 1991) p105. Among the thinkers he identifies as instrumental realists are Ian Hacking, Patrick Heelan, Robert Ackermann and himself.

8. Leibniz, Gottfried *Discourse on Metaphysics and Related Writings* tr. R.N.D. Martin and Stuart Brown (Manchester and New York: Manchester University Press, 1988) sections 17-8.

9. Heidegger, Martin *The Question Concerning Technology and Other Essays* (New York: Harper and Row, 1977) pp21-3.

10. I am not accepting that technology is ethically neutral. In fact, technology generates ethical problems and technologists often co-opt ethical decision making by framing the issues involved as purely technological ones.

11. Ihde, Don *Technology and the Lifeworld: From Garden to Earth* (Indianapolis: Indiana University Press, 1990) op. cit. program 2: Cultural Hermeneutics.

12. Another good example of amplification and reduction is the use of the telephone. The distance that the voice can carry is amplified while a number of communicative aspects of discourse are reduced or eliminated. Gestures, facial expressions, and elements of the tone of the voice are either absent or greatly diminished. For the issues of technological mediation, transparency, non-neutrality, and the amplification-reduction effect, see Ihde, Don "The Technological Embodiment of Media", in Hyde, Michael J. ed. *Communication Philosophy in the Technological Age* (Alabama University Press, 1982).

13. A technological imperative means that the form that society takes is determined by the needs of the technology instead of the needs of the people within the society. This occurs due to "reverse adaptation", where people accommodate themselves to the needs of their technologies, and increasing complexity and interdependence within the technological system. This doctrine of technology is often called the Frankenstein phenomena and is put forward by Langdon Winner in *Autonomous Technology: Technics out of Control as a Theme in Political Thought* (Cambridge, MA: M.I.T. Press, 1977).

14. Winner, Langdon *The Whale and the Reactor* (Chicago: University of Chicago Press, 1986) pp10-2.

15. Feenberg, Andrew *Questioning Technology* (London: Routledge, 1999) p126.
16. This relation was first explored in Feenberg, Andrew *Critical Theory of Technology* (New York: Oxford University Press, 1991).
17. The enthusiasm with which the Soviet Union adopted Frederick Winslow Taylor's forms of scientific management is one example, but more obviously, if the workers are to seize the means of production (the technology of production) they will of course desire them to be as developed as possible.
18. There have been numerous cases where the opposite was true. Technology transfers have significantly disrupted cultural life, often to the point of having devastating effects.
19. Feenberg, *Critical Theory of Technology* p80-3.
20. Watzlawick, Paul *How Real is Real: Communication, Confusion, Disinformation* (New York: Penguin Press) pp50, 81. *The Invented Reality* ed. Paul Watzlawick, (New York: W. W. Norton & Company, 1984) chapter 2 and pp207-44.
21. That the technology may be used in other ways, or have unintended consequences, does not change the fact that the technology entails a greater or lesser range of regimes that must accompany its continued use (or misuse).
22. This stands in sharp contrast to Herbert Schiller's claim that the transfer of technology in itself is a transfer of ideology, since the equipment embodies aspects of the ideology that produces it. Schiller, Herbert I. *Communication and Cultural Domination* (New York: M. E. Sharp Press, 1976, out of print). Rather than one culture being undermined or dominated by the other, Ihde argues that a new form of exchange (a pluriculture) has arisen. Ihde, Don *Postphenomenology*.
23. The ambiguity of technology as discussed in Ihde's *Technology and the Lifeworld: From Garden to Earth* is related to the essential ambiguity of the human condition pointed out as a recurrent theme in existential phenomenology. The fact that everything in human relations is both natural and manufactured is a major aspect of this ambiguity, see Maurice Merleau-Ponty *The Phenomenology of Perception* (New Jersey: The Humanities Press, 1962) p189. The notion that technology is embedded in a specific way in a culture and that it is therefore not transferred but rather reinterpreted or retranslated echoes the thought that no language when taken in its most primordial singularity can be fully translated to another. The specific meanings are bound to the world-view constructed by the linguistic group.